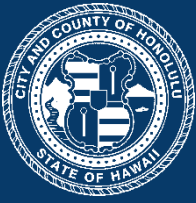


Resilient O'ahu

City and County of Honolulu
Office of Climate Change,
Sustainability and Resiliency





Mandate from O'ahu Voters

The Office of Climate Change, Sustainability and Resiliency is a Charter-mandated City office created to respond to climate change, resilience, and other sustainability challenges.



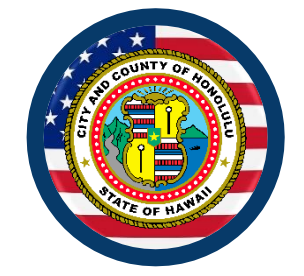
**Green
City Operations**



**Reduce Climate
Emissions & Impact**



**Promote Resilient
Communities**



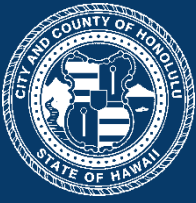
**Coordinate with
Federal & State Agencies**



**Ensure Sustainable
City Plans & Policies**



**Facilitate Climate
Change Commission**



Resolution 19-233

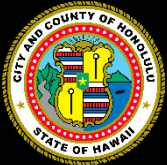
Guiding policy document for the City

Ola

O'AHU
RESILIENCE
STRATEGY

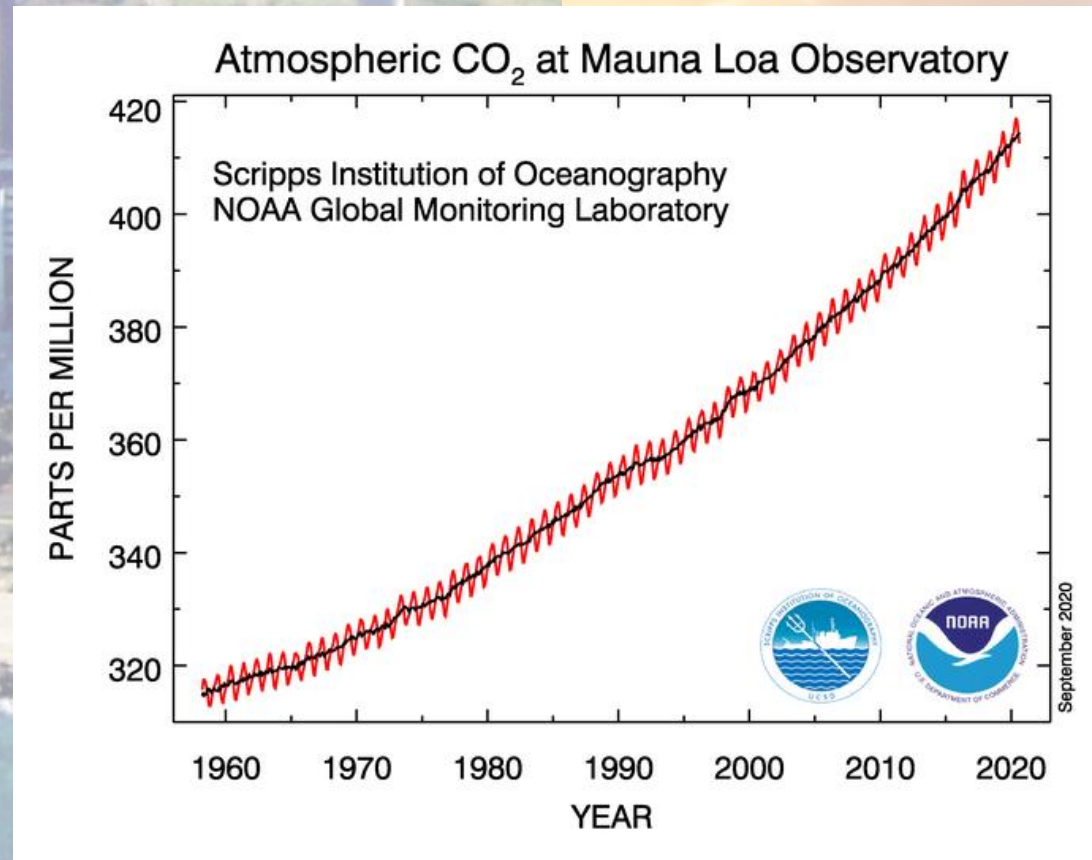


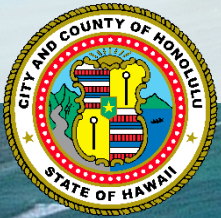
Our Climate



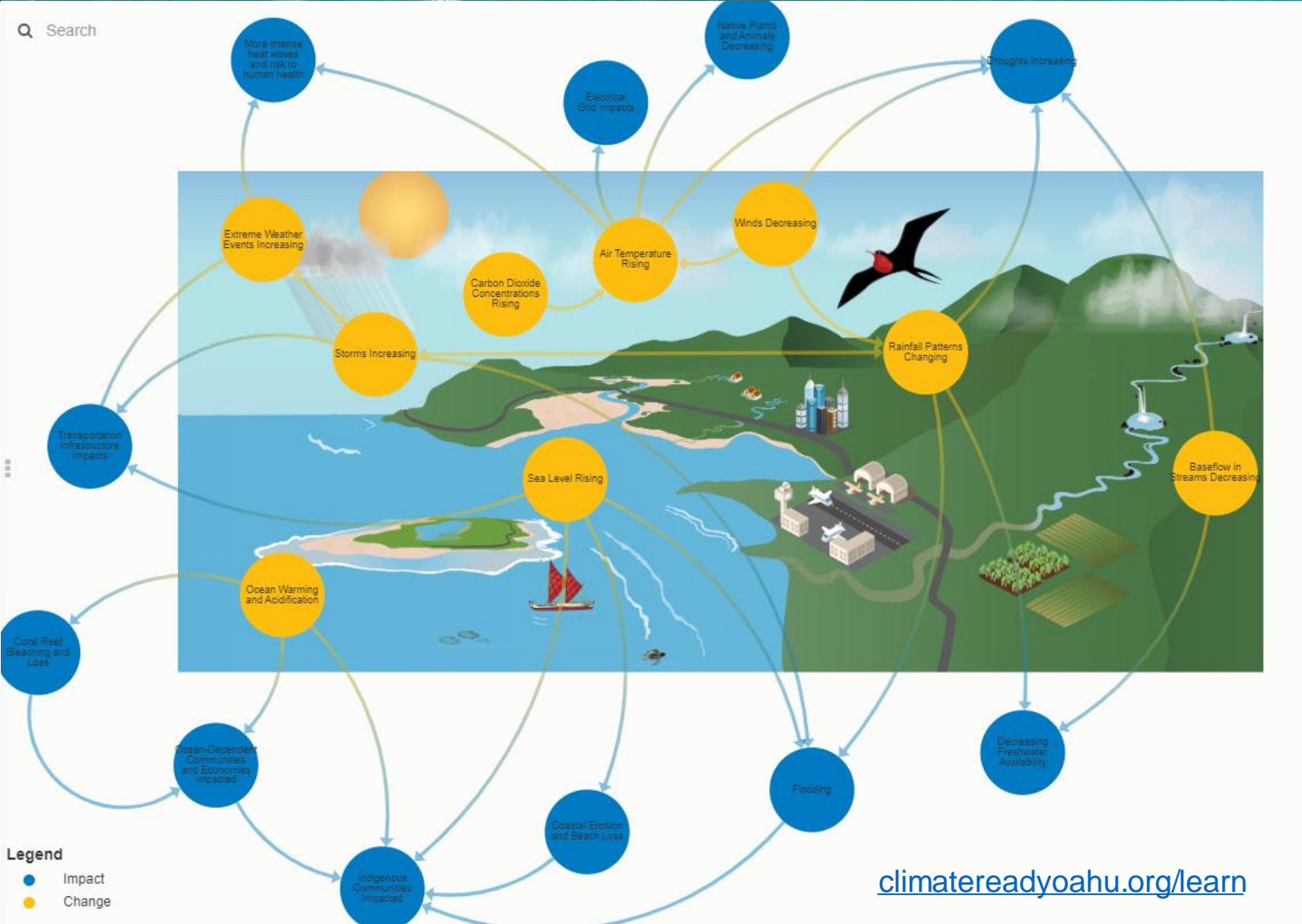
We are dumping 110 million tons of manmade global warming pollution into the atmosphere every 24 hours.

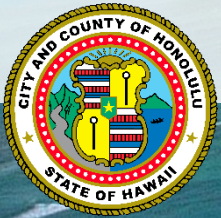
Data: Intergovernmental Panel on Climate Change



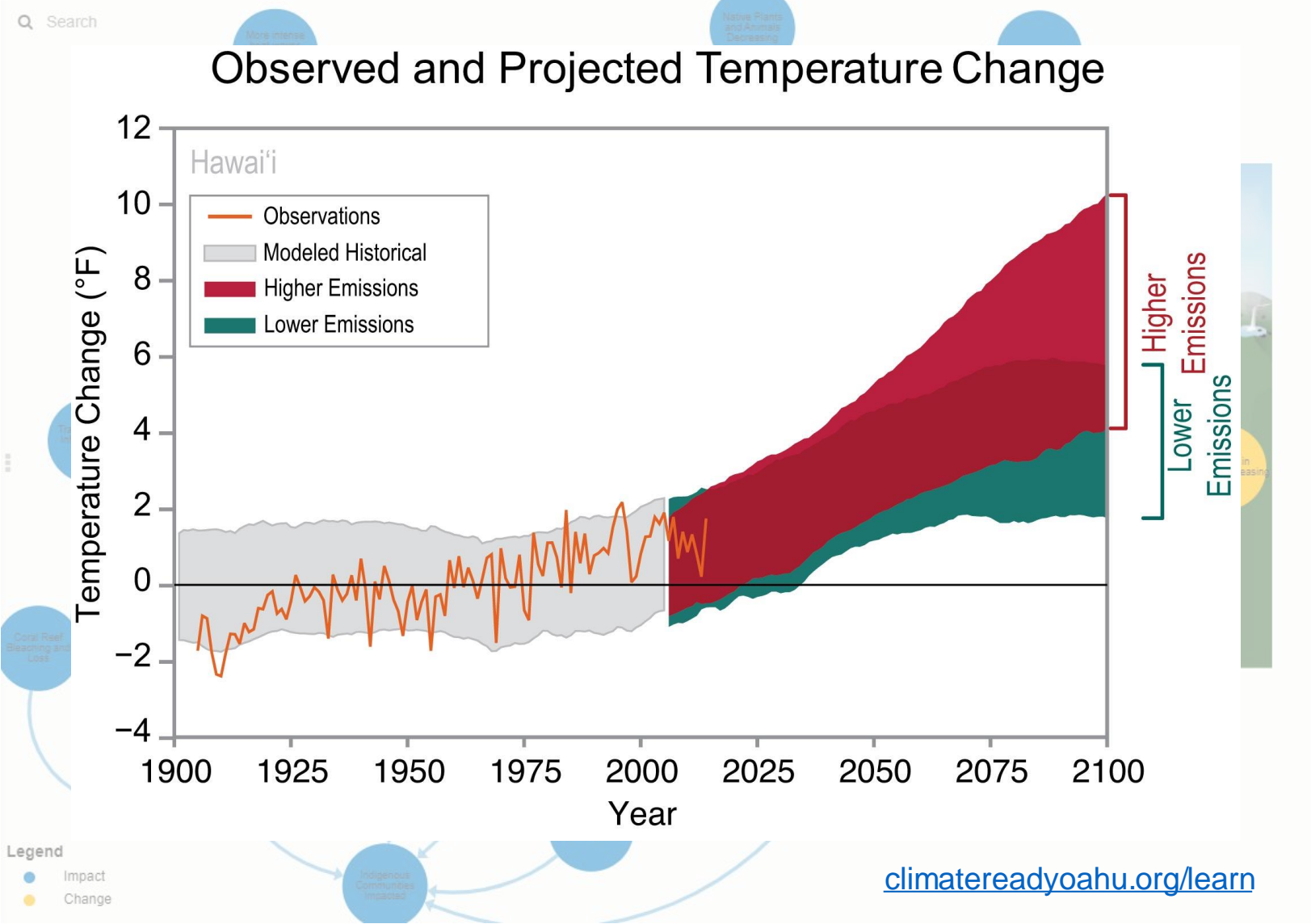


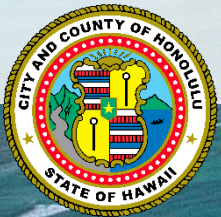
Climate Change and Impacts





Climate Change and Impacts





Climate Change and Impacts

2019 Record Maximum Temperatures

Preliminary Record Maximum Temperatures

January to December
2019



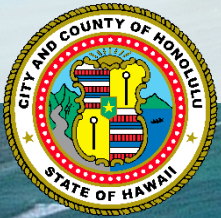
2019 ended with a record maximum temperature of 83°F at Lihue Airport. There were 273 record maximum temperatures recorded during 2019 that either broke or tied with previous records in Hawaii.

| Location | Daily Records Broken | Daily Records Tied | Total Daily Records |
|----------------|----------------------------|--------------------------|------------------------|
| Lihue, Kauai | 31 | 39 | 70 |
| Honolulu, Oahu | 21 | 32 | 53 |
| Kahului, Maui | 61 | 45 | 106 |
| Hilo, Hawaii | 22 | 22 | 44 |
| Total | 135 | 138 | 273 |

National Weather Service Honolulu
January 1, 2020 *issued at 5 PM HST*

**See [ndbc.noaa.gov](https://www.ndbc.noaa.gov) for official report and archived data*





O'ahu Resilience Strategy, SVI



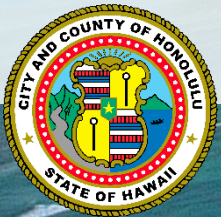
**Bouncing
Forward
Working
Group**

Group Question

Which residents and communities are most vulnerable to climate hazards risks and what household and community-level actions can best prepare these populations?

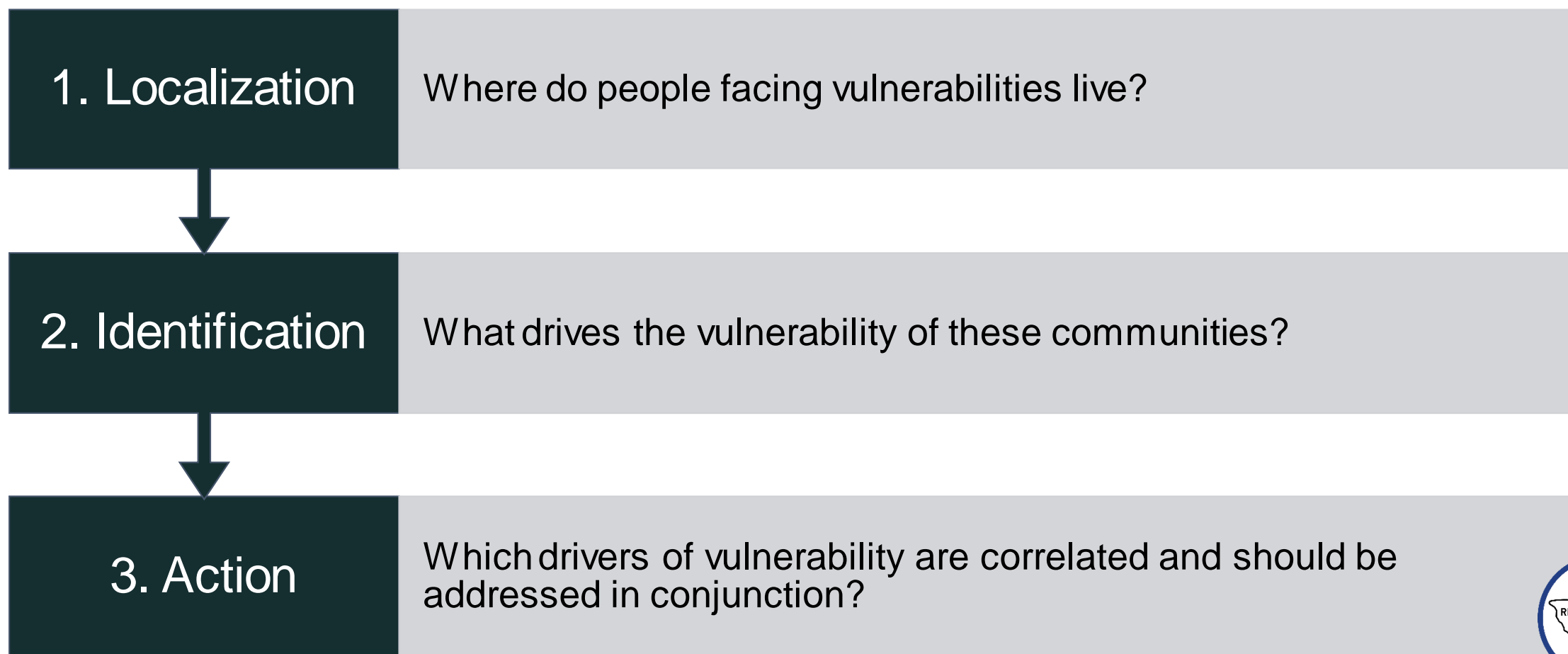
*Socioeconomic
Vulnerability Index*

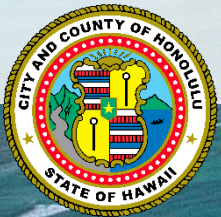




O'ahu Resilience Strategy, SVI

SVI Development, Principal Component Analysis (100 Resilient Cities and AECOM)

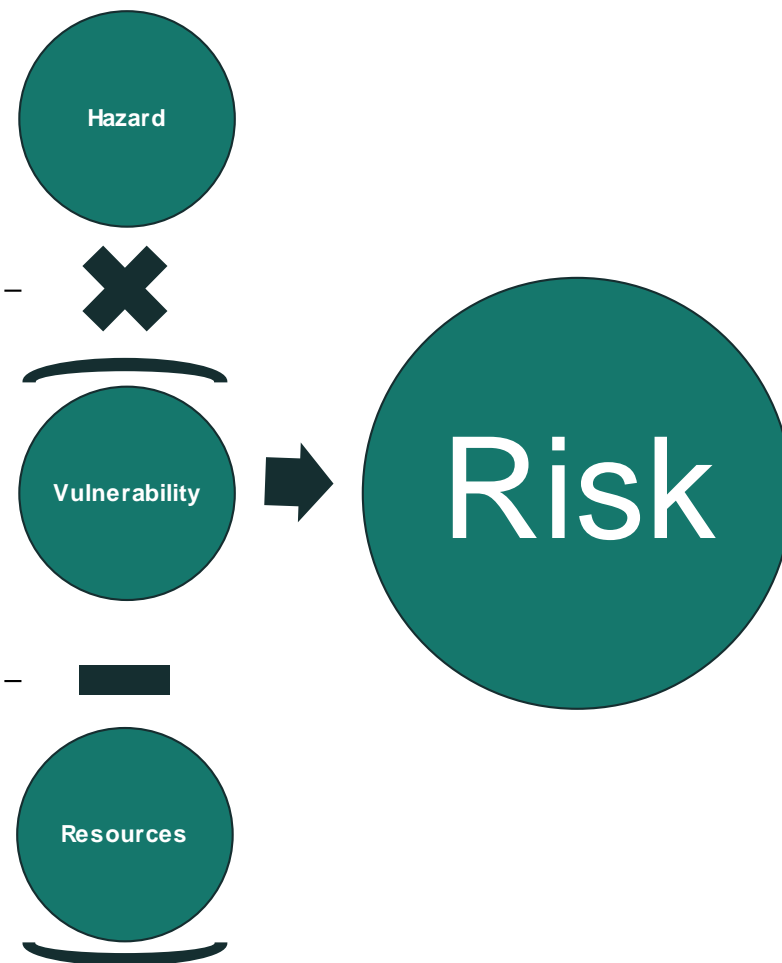


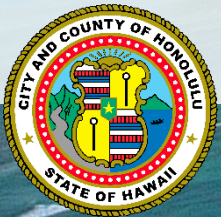


O'ahu Resilience Strategy, SVI

SVI Development, Principal Component Analysis (100 Resilient Cities and AECOM)

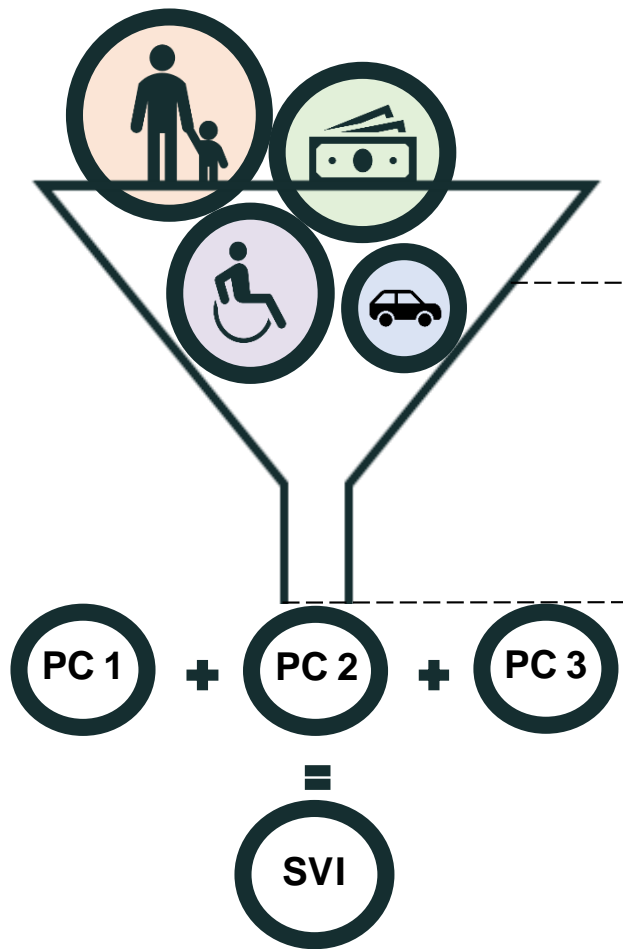
- ***Hazard*** is a condition posing the threat of harm
- ***Vulnerability*** is the extent to which persons, places, or things are likely to be affected
- ***Resources*** are those assets in place that will diminish the effects of hazards





O'ahu Resilience Strategy, SVI

SVI Development, Principal Component Analysis (100 Resilient Cities and AECOM)



Variable Selection

The variables for a PCA are composed of a set of standard variables (based on Cutter 2003) and a set of localized and context specific variables.

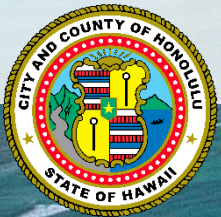
Principal Component Analysis

Creating new dimensions (Principal Components) that capture more variance than the original variables and thus reduce the number of variable to express the same information.

Construction of SVI

First, determine relevant number of Principal Components (PC).
Second, for each observation, add PC scores weighted by the contribution to the total variance explained to obtain the SVI.





O'ahu Resilience Strategy, SVI

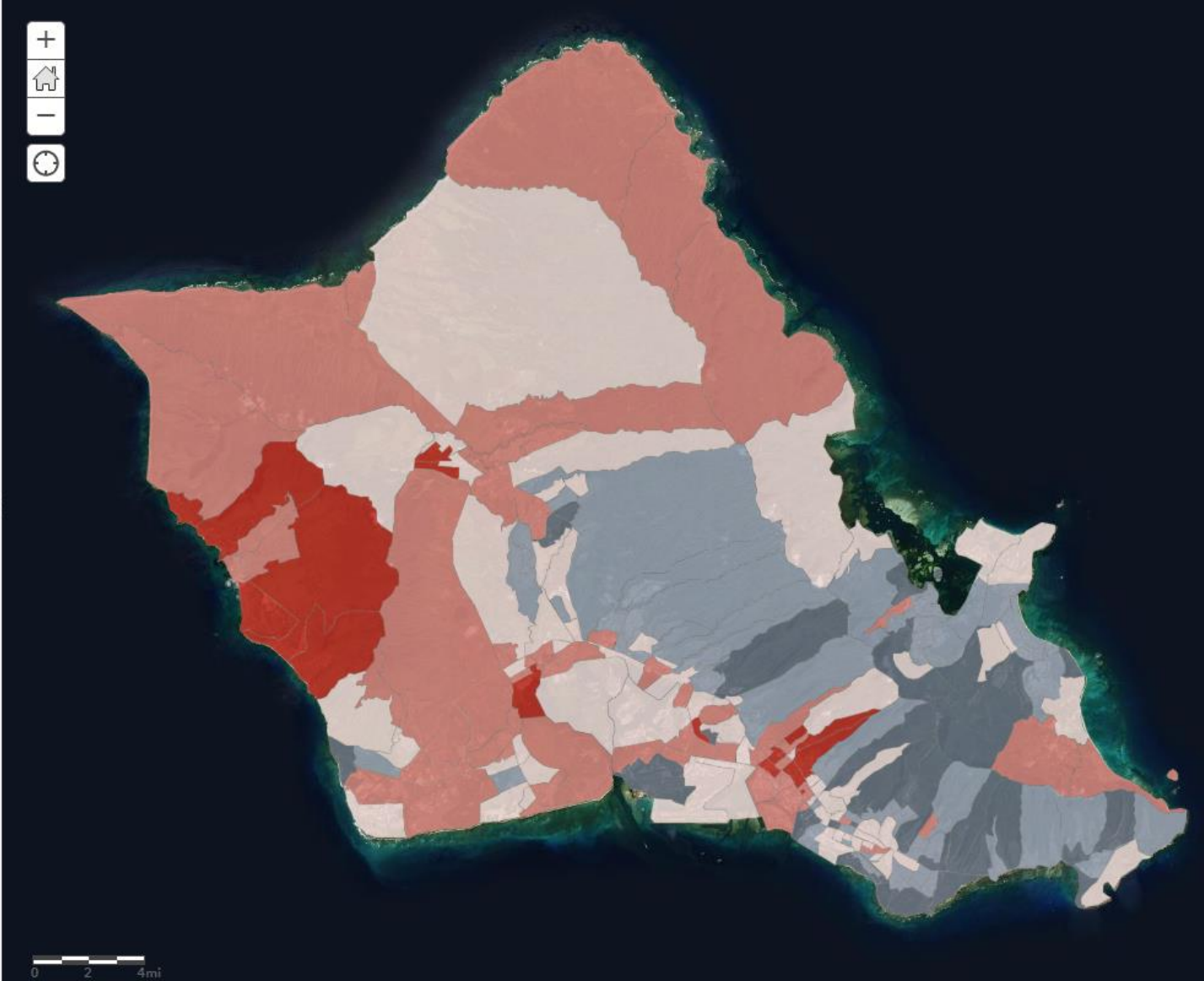
Legend

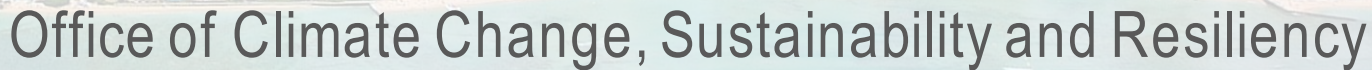
Oahu Social Vulnerability Index

SOVI

- Very High Vulnerability
- High Vulnerability
- Medium Vulnerability
- Low Vulnerability
- Very Low Vulnerability

[Home](#) [Tour Center](#) [Legend](#) [Contact Us](#)





O'ahu Community Heat Assessment



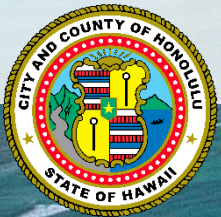
Data collected August 31, 2019

Record day for Honolulu

Supported by
NOAA Climate Program Office
and CAPA Strategies

bit.ly/oahuheatmap





O'ahu Heat Vulnerability Map Series

O'ahu Heat Vulnerability Map Series

[An Introduction](#)[Heat & Social Vulnerability](#)[Heat Adaptation Strategies](#)

A Story Map

An Introduction to O'ahu's Heat Vulnerability

How does surface material affect local temperatures?

Zoom into your neighborhood using the spy glass.

- Which surfaces/areas are hotter?
- Which surfaces/areas are cooler?
- What do you notice about different heat index values across the island?

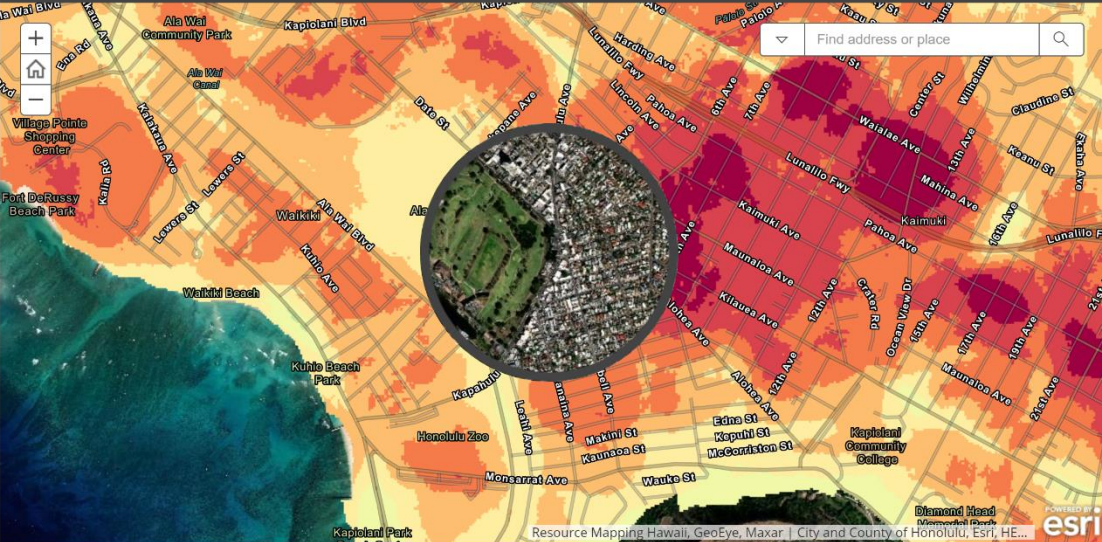
Get involved in the Climate Adaptation Strategy to address climate vulnerability in your neighborhood. Visit climateredyoahu.org to learn more! We'd love to hear from you!

Citations

Community Heat Assessment Web Map

Community Heat Assessment Web Map

Find address or place



esri

bit.ly/oahuheatvulnerability

Best ways to stay safe is to know where your neighborhood resources are.

Use the map to locate [Hospitals](#) and [Community Health Centers](#) in case you have a health emergency from heat stress, heat stroke, or other heat-related illnesses. Call the City's [Emergency Medical Services](#) at 9-1-1 if you have an emergency.

Use the map to locate [Libraries](#) which often have facilities with air-conditioning to help keep you

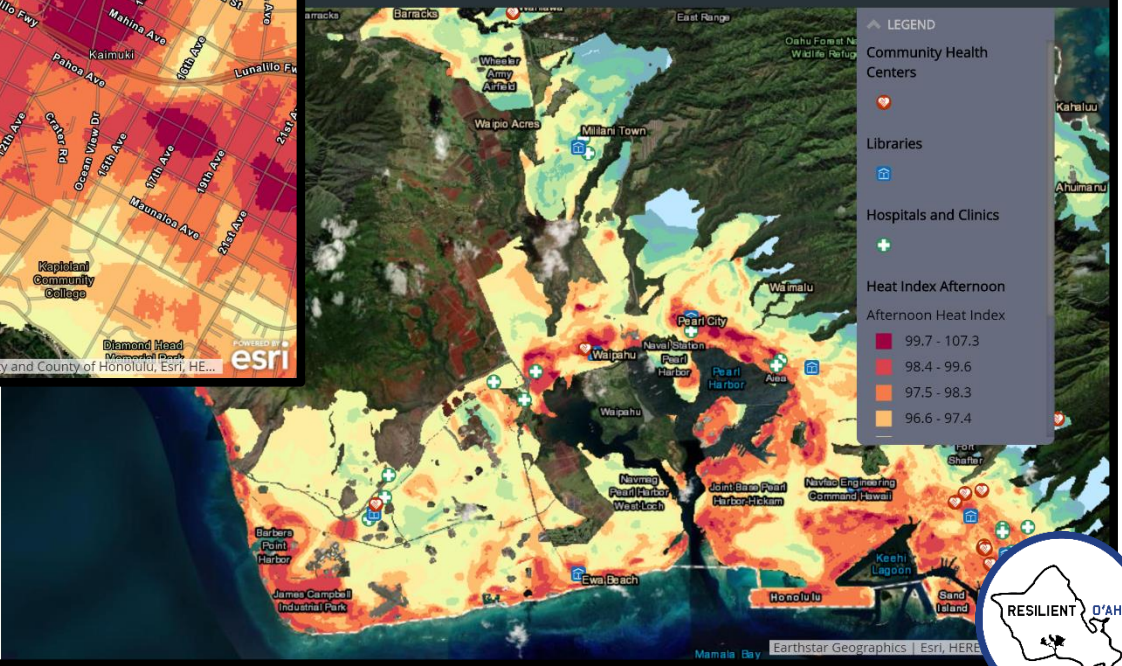
A Story Map

LEGEND

- Community Health Centers
- Libraries
- Hospitals and Clinics
- Heat Index Afternoon

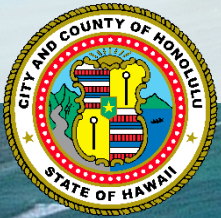
Afternoon Heat Index

- 99.7 - 107.3
- 98.4 - 99.6
- 97.5 - 98.3
- 96.6 - 97.4



esri





O'ahu Heat Vulnerability Map Series

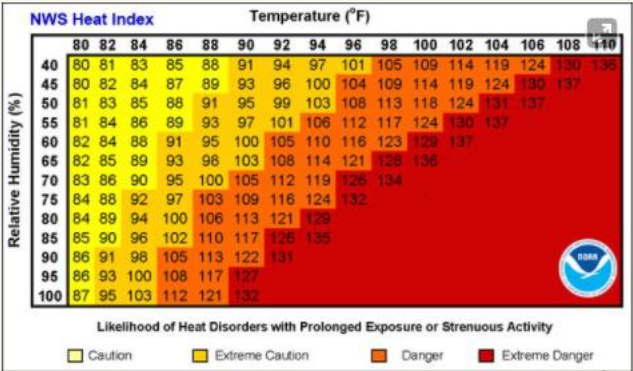
The Intersection of Heat and Social Vulnerability

Which communities get the hottest?

Use the mapping tool to explore the intersection between heat index and social vulnerability.

Heat Index Afternoon

The heat index, also known as the apparent temperature, is what the temperature feels like to the human body when relative humidity is combined with the air temperature.

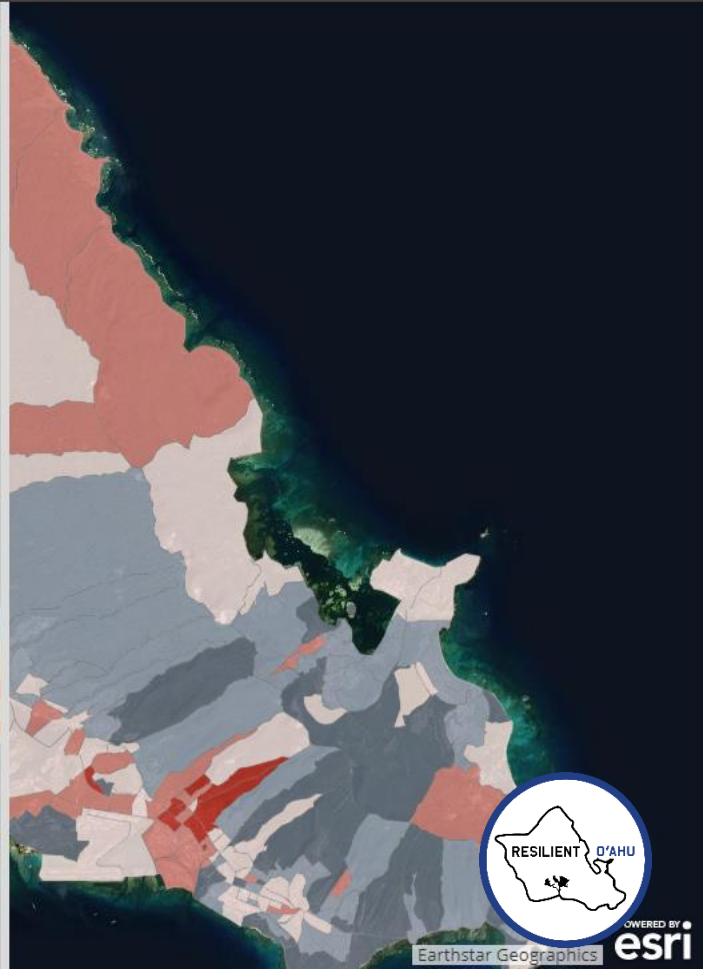
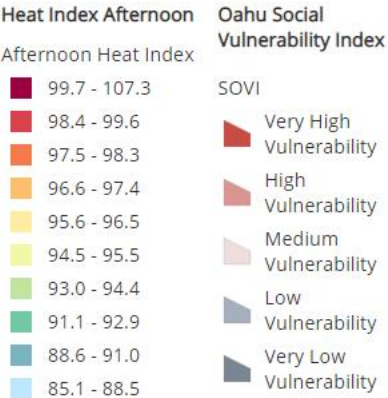


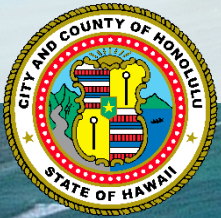
NOAA's National Weather Service Heat Index Chart

Social Vulnerability Index (SOVI)

The SOVI assesses and ranks a community's resilience by considering vulnerability and adaptive capacity across multiple

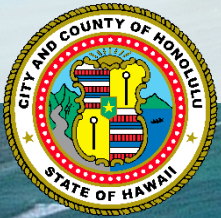
Heat Index Afternoon





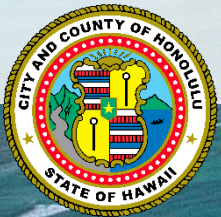
Ecosystem and Human Health





Ecosystem and Human Health

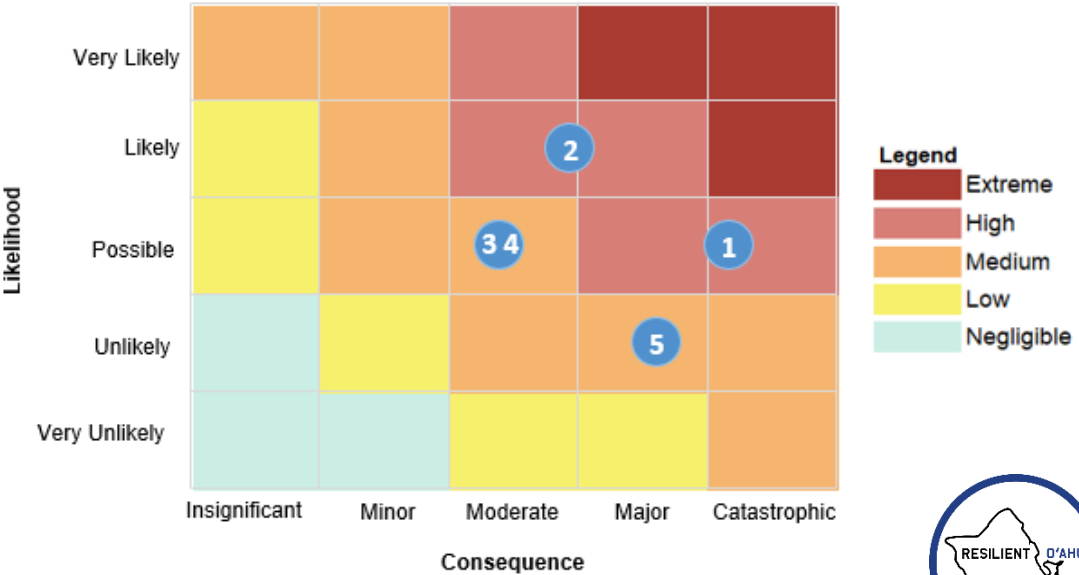
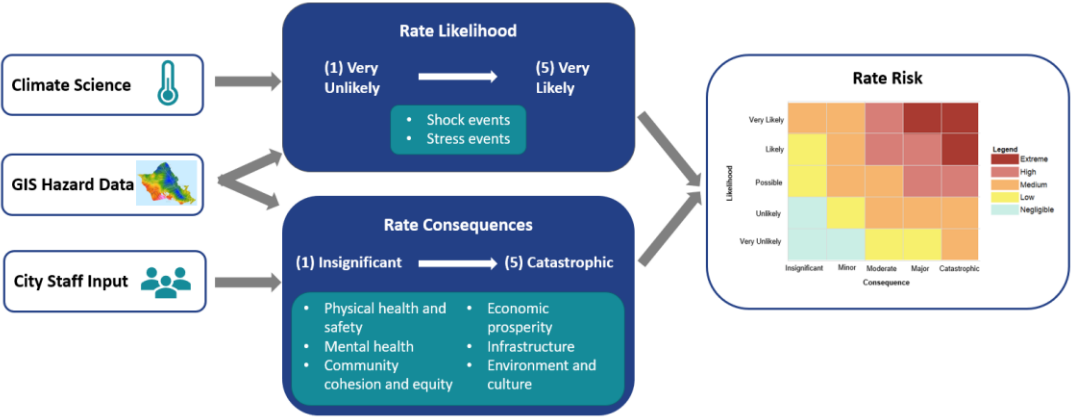


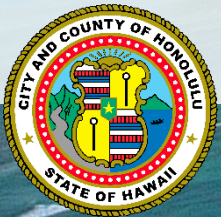


Climate Ready O‘ahu, Risk Assessment

Climate Risk Assessment

| | Climate Hazard | Scenario | Current Rating (Score) | 2050 Rating (Score) |
|---------|------------------------------------|--|------------------------|---------------------|
| 1 | Sea level rise and coastal erosion | Sea level rise and associated coastal erosion on a trajectory to 3.2 feet by 2100 with impacts due to high tides and/or coastal hazard events decades in advance | Medium (9.3) | High (14.0) |
| 2 | Increase in temperature | Increase in average annual temperature of 2.7°F to 4.5°F contributing to heat waves | Medium (6.9) | High (13.8) |
| 3 (tie) | “Rain bomb” | Significant rain event with 4 inches of rain/hour | Medium (5.8) | Medium (8.7) |
| 4 (tie) | Decrease in precipitation | Leeward side of island becomes up to 60% drier contributing to droughts | Medium (5.8) | Medium (8.7) |
| 5 | Hurricane | Landfall of a major hurricane with storm surge, rainfall, and high winds | Low (4.1) | Medium (8.2) |





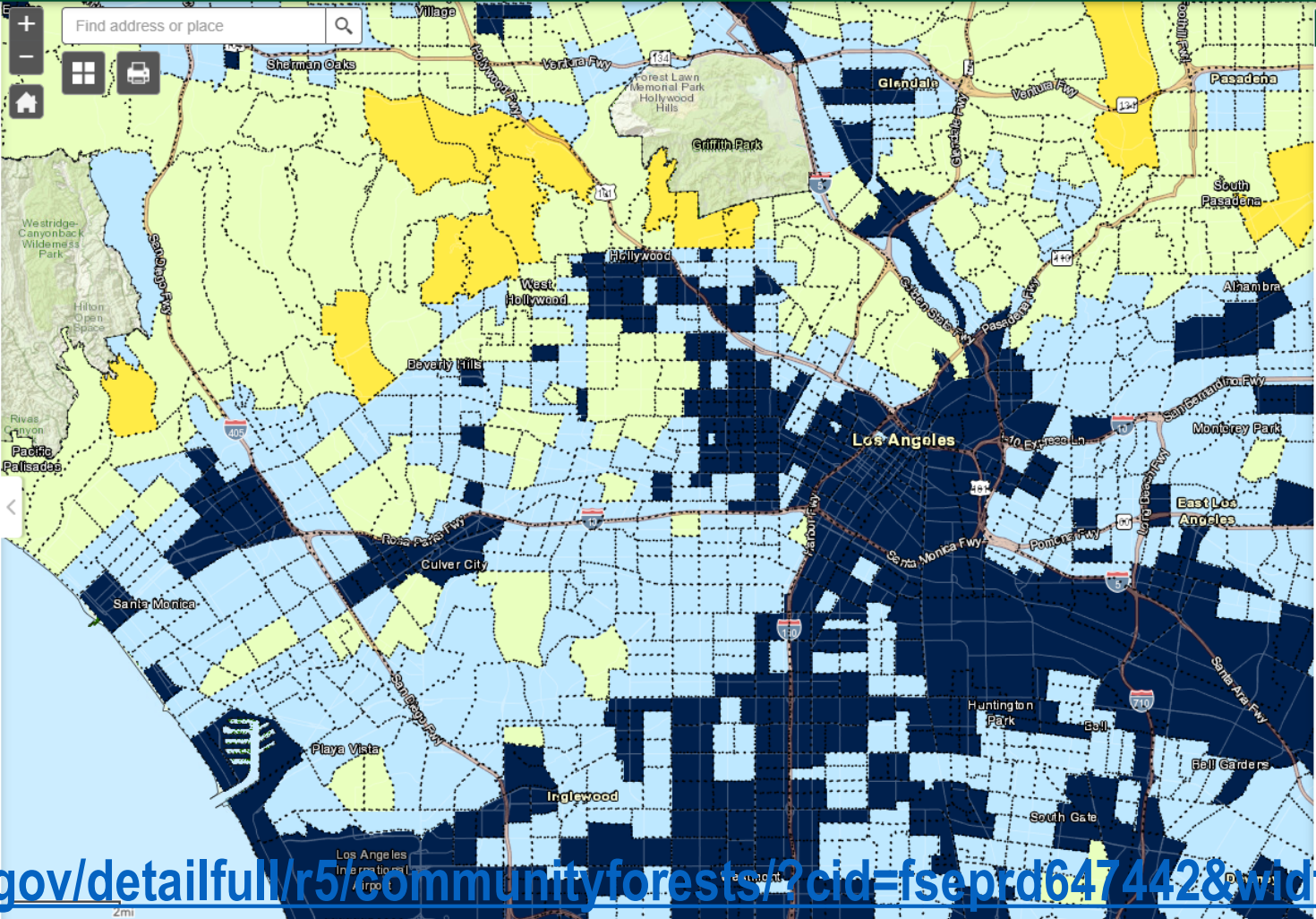
O'ahu Canopy and Community Assessment

Region 5 Interactive Maps

State, Private & Community Forests

USDA Urban Tree Canopy in California

- Layers
- ☒ Urban area boundaries
 - ☒ CA census tracts
 - ☒ Neighborhoods and roads
 - ☒ Percent canopy cover 2018
 - ☒ Urban canopy 2018
 - ☐ Population size 2010
 - ☐ Poverty incidence
 - ☐ Asthma incidence
 - ☐ Cardiovascular disease incidence
 - ☐ Ozone pollution
 - ☐ PM 2.5 pollution
 - ☐ Water body impairment
 - ☐ Urban Heat Island Index



Legend

Urban area boundaries

CA census tracts

Percent canopy cover 2018

- Percent canopy cover
- 42-86
 - 25-41
 - 15-24
 - 0-14

Urban canopy 2018

Canopy cover 2018

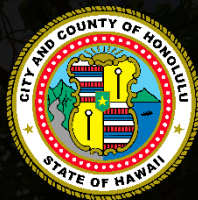


<https://www.fs.usda.gov/detailfull/r5/communityforests/?cid=fseprd647442&width=full>

Mahalo



Office of Climate Change, Sustainability and Resiliency



(808) 768-2277

resilientoahu@honolulu.gov

resilientoahu.org

[@ResilientOahu](https://www.instagram.com/ResilientOahu)